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HOUSEKEEPERS' CHAT

Saturday, April 2, 1938

(FOR BROADCAST USE ONLY)

SUBJECT: "New Filter to Save Teeth." Information from the Office of Experiment Stations, U. S. Department of Agriculture.

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A simple little bone filter for drinking water, developed during the past year at the Arizona Experiment Station may save the teeth of thousands of American children. This bone filter removes from water the fluorine that has already done permanent damage to the teeth of countless children.

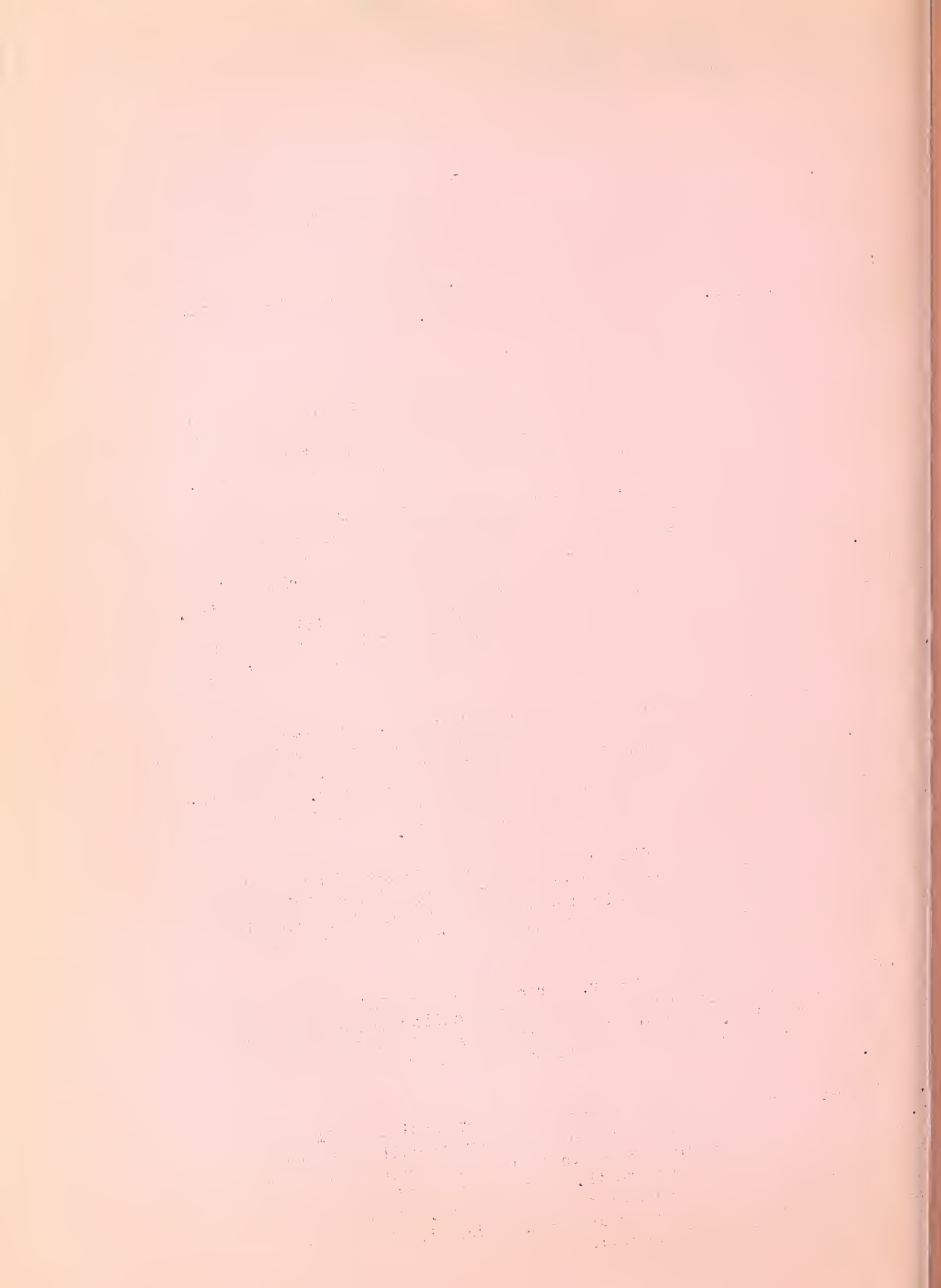
As little as 1 part fluorine in a million parts water may damage the enamel of teeth as they are forming, yet drinking water in certain sections of this country contains as much as 12 to 18 parts fluorine to a million parts water. In 24 States as well as in every country of the world native-born inhabitants of certain sections suffer from teeth deformed by fluorine. In this country people in the arid States of the Southwest -- Arizona, Colorado, Texas and New Mexico -- are most in danger of this sort of tooth damage because fluorine compounds are likely to be more concentrated in the water.

Mottled enamel is what this tooth defect is called. Mottled enamel shows up most commonly in dull chalky-white weak teeth -- chalky white all over or in patches. More severe cases have pitted or corroded teeth, or teeth discolored by yellow or brown or almost black streaks or patches. The defect is permanent. Dentists can do little for it. And mottled enamel usually means continual dentist bills and false teeth eventually.

The story of the new bone filter which offers a means of preventing this trouble dates back to 1930 -- the year that a group of despairing parents in a small town in Arizona begged their State experiment station scientists to aid them in finding out why all the children born and raised in that community had disfigured teeth.

The problem was turned over to Dr. Margaret Connack Smith, a nutritionist at the Station, because it was thought that the children's diet might be the cause of the trouble. Defects in the structure of teeth often come from diet lacks -- lack of calcium or phosphorus or the vitamins needed for building teeth.

Dr. Smith and her helpers made a study of every native family in this small town. They found that except for one family every child who had lived in that community during the period when his teeth were forming had mottled enamel. Even the dogs had defective teeth. Most of the children showed the severest mottling on their second or permanent teeth. Those who had moved to the community between the ages of 6 and 12 had disfigured back teeth-- the teeth that develop during this period.



Others who had moved in after the age of 12 to 13 showed mottling only on the wisdom teeth. But those who came after all their permanent teeth were in showed no trace of the trouble.

Dr. Smith then made a study of the feed these families were eating, especially of the food of 4 families where the children's teeth were worst and of that one exceptional family which had no mottled enamel. But the diet records showed that these children's food was up to standard so the trouble could not have come from diet lacks.

Then working along with her husband who is an experiment station chemist, Dr. Smith analyzed the water supply. It was abnormally high in fluorine compounds. But the one family that had escaped mottled enamel had a well containing water that tested extremely low in fluorine.

The investigators took supplies of the high-fluorine water back to their laboratoroies and began giving it to young growing rats. The rats developed mottled enamel teeth. To other young rats they gave food in which they put small amounts of fluorine. These rats also grew defective teeth. Yet their brothers and sisters, which the scientists used for comparison and raised on food and water containing no fluorine, had sound teeth. Guinea pigs and dogs tested in the same way gave the same results.

From these studies Dr. Smith concluded that fluorine passes into the blood stream and interferes with the body's process of forming enamel on teeth but that it does not act in the mouth on teeth already developed. So people who do not begin drinking water containing fluorine until after their second teeth come in do not have mottled enamel. But the fluorine may still affect the dentine of the teeth which the body keeps nourished from the blood stream.

After discovering the cause of mottled enamel, the next step was to find some way to prevent it -- some way that city water supplies as well as water from the family well could be treated to remove the fluorine. Engineers, chemists, doctors and dentists have all been working on that problem. Many methods suggested have proved impractical because they cost too much or could only be used by a skilled chemist. But the recent Arizona discovery promises to be satisfactory for home use.

Back in 1893 a French chemist discovered that fluorine had what he called an "affinity" for bone. That was what gave the Arizona scientists the idea of filtering water through bone. Dr. Smith purchased bone from a packing house, cleaned it, boiled it, treated it and ground it to just the right fineness for the fluorine to act most effectively. Then she shook this powdered bone in fluorine water for two hours, filtered the water and found it practically free of fluorine. She went back to the same small town where she was called in for aid and set up her first bone filter in the high school there where the well water contains as much as 3 parts in a million of fluorine. The filtered water came out with barely a trace of fluorine. Since then Dr. Smith has devised a bone filter that can be fastened to the home water faucet to treat the water as it runs out. The amount of powdered bone needed, of course, depends on how much fluorine there is in the water. Roughly speaking, a pound of untreated bone which costs a cent at the packing house is enough to take care of 113 gallons of most fluorine-containing water. And by simple treatment this powdered bone may be used again and again.

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